CLAIMS.

I claim:

1.   A RAID system able to function with undiminished capacity despite the failure of

any storage array controller comprising:

5   n active storage array controllers,

n arrays of storage units, each active storage array controller connected by at least one

connector to one array of storage units,

each active storage array controller controlling one or more arrays of storage units, and

one only passive storage array controller,

10   the passive storage array controller connected by at least one connector to each active

storage array controller,

the passive storage array controller able to control any one of the arrays of storage devices

in the case of failure of an active storage array controller.

2.   A RAID system able to function with undiminished capacity despite the failure of a

15   storage array controller comprising:

three active storage array controllers,

three arrays of storage devices, each active storage array controller connected by at least

one connector to and controlling one or more arrays of storage units,

each array of storage units comprising a multiplicity of storage units and at least one

20   connector between each storage unit and the active storage array controller which controls that

array, each array comprised of a multiplicity of active storage units and one or more parity storage

units,

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one passive storage array controller,

each active storage array controller connected by at least one connector to the passive storage array controller, and

the passive storage array controller able to assume the identity of a failed active storage array controller and to control the at least one array of storage units controlled by the failed active storage array controller.

3.   The RAID system of claim 1 wherein two connectors connect each storage unit with one storage array controller.

4.   The RAID system of claim 1 wherein one connector connects each storage unit with each of greater than one storage array controller.

5.   The RAID system of claim 2 wherein two connectors connect each storage unit with one storage array controller.

6.   The RAID system of claim 2 wherein one connector connects each storage unit with each of greater than one storage array controller.

7.   The RAID system of claim 1 wherein each active storage array controller is connected by at least one connector to two adjacent active storage array controllers, forming a ring of active storage array controllers.

8.   The RAID system of claim 2 wherein each active storage array controller is connected by at least one connector to two adjacent active storage array controllers, forming a ring of active storage array controllers.

9.   The process of maintaining the channel capacity of a RAID system when an active storage array controller fails comprising the steps of:

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a.   ceasing the emission of the heartbeat by a defective active storage array controller,

b.   detecting the cessation of the heartbeat by a defective active storage array controller and emission of an activation signal by a reporter active storage array controller,

5   c.   detecting the activation signal by a passive storage array controller and assuming the identity of the defective active storage array controller by the passive storage array controller,

d.   identifying the DASD of the defective storage array controller by the passive storage controller using a table on each DASD,

10   e.   assuming control of the DASD of the defective storage array controller by the passive storage controller.

10.   The method of claim 9 further comprising after step e:

f.   emitting a defective storage array controller signal by the reporter storage array controller or the passive storage array controller.

15   11.   The process of maintaining the channel capacity of a RAID system when an active storage array controller fails comprising the steps of:

a.   ceasing the emission of the heartbeat by a defective active storage array controller,

b.   detecting the cessation of the heartbeat by a defective active storage array 20   controller by a passive storage array controller,

c.   assuming the identity of the defective active storage array controller by the passive storage array controller,

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d.   identifying the DASD of the defective storage array controller by the

passive storage controller using a table on each DASD,

e.   assuming control of the DASD of the defective storage array controller by

the passive storage controller.

5   12.   The method of claim 11 further comprising after step e:

f.   emitting a defective storage array controller signal by the reporter storage

array controller or the passive storage array controller.